4.6 AIR QUALITY

4.6.1 Environmental Setting

Air quality is a function of both the amount and location of pollutant emissions as well as meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, which affects air quality.

Regional Topography, Climate, and Meteorology

The proposed pipeline would be constructed from a location in San Joaquin County, just south of the Sacramento/San Joaquin County Line, to a location approximately nine miles to the north, near Elk Grove in the southern part of Sacramento County. The Project area is at the southern end of the Sacramento Valley, which is bounded by the Coast and Diablo ranges on the west and the Sierra Nevada on the east. The portion of the proposed pipeline that would be in San Joaquin County would be in the San Joaquin Valley Air Basin (SJVAB) and the portion of the proposed pipeline that would be in Sacramento County would be in the Sacramento Valley Air Basin (SVAB). The proposed Project area is approximately 55 miles northeast of the Carquinez Strait, a sea-level gap between the Coast Range and the Diablo Range.

Temperature variation in the proposed Project area is relatively high seasonally, as well as daily. The average maximum and minimum winter (i.e., January) temperatures in the region are 52 ºF and 36 ºF, respectively, while average summer (i.e., July) maximum and minimum temperatures are 90 ºF and 56 ºF, respectively (WRCC 2007). The annual average of total precipitation received in the Project area is approximately 17 inches (WRCC 2007). The prevailing wind is from the south, primarily because of marine breezes through the Carquinez Strait, although during winter, the sea breezes and winds from the north occur more frequently.

Between late spring and early fall, a layer of warm air often overlays a layer of cool air influenced by the Delta and San Francisco Bay, resulting in air temperature gradients that cause stagnation of air referred to as an inversion. Typical winter inversions are formed when the sun heats the upper layers of air, trapping air below that has been cooled by contact with the colder surface of the earth during the night. Although each inversion type predominates at certain times of the year, both types can occur at any

time of the year. Because inversions inhibit the vertical mixing of air in the atmosphere, they can prevent air pollution from dispersing, contributing to higher ground surface pollutant concentrations.

Existing Air Quality

Monitoring stations that collect air quality data are located throughout Sacramento County and the greater Sacramento region. The closest monitoring station to the proposed pipeline route is the Elk Grove station located near the intersection of Elk Grove Boulevard and Bruceville Road, approximately two miles east of the northern end of the proposed pipeline route. This monitoring station only collects data for ozone and nitrogen dioxide. The closest monitoring station to the proposed pipeline route that collects other criteria pollutant data is in Sacramento on T Street. The T Street station also measures carbon monoxide (CO), particulate matter 10 microns or smaller in diameter (PM_{10}), and particulate matter 2.5 microns or smaller in diameter ($PM_{2.5}$). Recent air quality data for ozone and nitrogen dioxide collected at the Elk Grove station and data for CO, PM_{10}, and $PM_{2.5}$ collected at the Sacramento T Street monitoring station are summarized in Table 4.6-1 and compared with California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Criteria air pollutants are classified in each air basin, county, or in some cases, within a specific urbanized area. The classification is determined by comparing actual monitoring data with State and Federal standards. If a pollutant concentration is lower than the standard, the area is classified as “attainment” for that pollutant. If an area exceeds the standard, the area is classified as “non-attainment” for that pollutant. If there are not enough data available to determine whether the standard is exceeded in an area, the area is designated “unclassified.” The attainment status for Sacramento and San Joaquin counties for the criteria pollutants is summarized in Table 4.6-2.

The criteria air pollutants most relevant to air quality planning and regulation in Sacramento and San Joaquin counties include ozone, CO, PM_{10} and $PM_{2.5}$. Each of the relevant criteria pollutants is described below in the context of each county’s attainment status.

Table 4.6-1. Project Area Air Quality Summary - 2004 through 2006

Pollutant	Standard	Monitoring Data by Year		
		2004	2005	2006
Ozone				
Highest 1 Hour Average (ppm)		0.10	0.11	0.14
Days over State Standard	0.09	1	7	10
Highest 8 Hour Average (ppm)		0.09	0.10	0.11
Days over National Standard*	0.08	1	2	7
Carbon Monoxide				
Highest 8 Hour Average (ppm)		3.0	3.6	---
Days over State Standard	9.0	0	0	---
Nitrogen Dioxide (NO_2)				
Highest 1 Hour Average (ppm)		0.04	0.05	0.05
Days over State Standard*	0.25	0	0	0
Annual Average (ppm)	0.053[a]	0.008	0.008	0.009
Particulate Matter (PM_{10})				
Highest 24 Hour Average ($\mu g/m^3$)		58	53	49
Days over State Standard	50	1	4	1
Annual Average ($\mu g/m^3$)	20[b]	20	21	12
Particulate Matter ($PM_{2.5}$)*				
Highest 24 Hour Average ($\mu g/m^3$)		46	59	40
Days over National Standard*	65	0	0	0
Annual Average ($\mu g/m^3$)	12[b]	---	13	---

[a] Federal Standard

[b] State Standard

Notes: ppm = parts per million; µg/m3 = micrograms per cubic meter.

*The California Air Resources Board (CARB) approved a new State 8-hour ozone standard of 0.07ppm on May 17, 2006, and new State 1-hour and annual NO_2 standards of 0.18 ppm and 0.03 ppm, respectively on February 22, 2007. The EPA approved a new Federal 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ on September 21, 2006. The old standards are presented in the table because they are the ones that CARB and EPA used to determine the amount of days over the standards.

--- indicates there was insufficient (or no) data available to determine the value.

Source: CARB 2007a.

Table 4.6-2. Attainment Status of Sacramento and San Joaquin Counties

Pollutant	Federal Status	State Status
Sacramento County		
Ozone (O_3) – 1 hour	N/A	Non-attainment
Ozone (O_3) – 8 hour	Nonattainment	Non-attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Unclassified	Attainment
Inhalable Particulate (PM_{10})	Nonattainment	Non-attainment
Inhalable Particulate ($PM_{2.5}$)	Attainment	Nonattainment
San Joaquin County		
Ozone (O_3) – 1 hour	N/A	Non-attainment
Ozone (O_3) – 8 hour	Nonattainment	Non-attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Unclassified	Attainment
Inhalable Particulate (PM_{10})	Nonattainment	Non-attainment
Inhalable Particulate ($PM_{2.5}$)	Nonattainment	Non-attainment

Note: N/A = not applicable.

Source: CARB 2007b.

Ozone is a gas that is formed when reactive organic gases (ROG) and nitric oxides (NO_x), which are both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. Because they are the main components of ozone, ROG and NO_x are known as "ozone precursors." In the Sacramento region, the primary sources of ozone precursors are on-road sources (at 47 percent), followed by other mobile sources (at 29 percent), and stationary/area sources (at 24 percent).

Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable to ozone formation. The Federal government uses a number of different classifications to describe the extent to which an area is in non-attainment status for the Federal ozone standard. Sacramento County was classified as being in "severe" non-attainment for the one-hour ozone standard and San Joaquin County was classified as being in extreme nonattainment for the one-hour standard. However, the one-hour standard was revoked by the U.S. Environmental Protection Agency (EPA) in June 2005, and replaced with the more stringent eight-hour ozone standard. The EPA has designated Sacramento

and San Joaquin counties as nonattainment areas for the eight-hour standard. The counties are also in nonattainment of the State one-hour and eight-hour ozone standards.

Carbon Monoxide is a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground level. Because CO is emitted directly from internal combustion engines and motor vehicles operating at slow speeds are the primary source of CO in the Sacramento and San Joaquin valley air basins, the highest ambient CO concentrations are generally found near congested transportation corridors and intersections. Additional traffic generated by development projects may increase congestion at nearby intersections, and consequently increase the likelihood of creating high levels of CO.

Through control measures adopted by Federal, State, and local agencies, both Sacramento and San Joaquin counties have attained the Federal and State CO standards. However, the potential still exists for incidents of high localized concentrations of CO.

Particulate Matter (PM_{10} and $PM_{2.5}$) consists of extremely small, suspended particles or droplets 10 microns or smaller in diameter (PM_{10}), and 2.5 microns or less ($PM_{2.5}$). PM_{10} and $PM_{2.5}$ are often referred to collectively as particulate matter or "PM." Some sources of PM, like pollen and windstorms, are naturally occurring. However, in populated areas most PM is caused by road dust, diesel soot, combustion products, abrasion of tires and brakes, and construction activities. Particulates are a concern because they can be inhaled deep into the lungs and cause respiratory problems.

Monitoring data for Sacramento County shows that the county is in attainment of the Federal PM_{10} and $PM_{2.5}$ standards. However, the EPA has not officially changed the basin's designation to attainment for PM_{10}. Consequently, the Sacramento region is officially in non-attainment status for the Federal PM_{10} standards, the more stringent State PM_{10} standards, and the State annual $PM_{2.5}$ standard. San Joaquin County is in non-attainment of Federal and State PM_{10} and $PM_{2.5}$ standards.

Toxic Air Contaminants

In addition to the criteria air pollutants, another group of airborne pollutants called toxic air contaminants (TACs) are known to be highly hazardous to health, even in small

quantities. TACs are airborne substances capable of causing short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects (e.g., injury or illness).

TACs can be emitted from a variety of common sources, including gasoline stations, automobiles, dry cleaners, industrial operations, painting operations, etc. Natural emission sources include windblown dust and wildfires. Farms, large construction sites, and residential areas can also contribute to toxic air emissions. The California Air Resources Board (CARB) has recently identified diesel particulate matter as also being a TAC. Regulation of TACs is achieved through Federal and State controls on individual sources. The 1990 Federal Clean Air Act Amendments offer a comprehensive plan for achieving significant reduction in both mobile and stationary source emissions of certain designated Hazardous Air Pollutants (HAPs). All major stationary sources of designated HAPs are required to obtain and pay the required fees for an operating permit under Title V of the Federal Clean Air Act Amendments.

TAC impacts are assessed using a standard Maximally Exposed Individual (MEI) health risk of 10 in one million. The CARB and local air districts have determined that any source that poses a risk to the general population that is equal to or greater than 10 people out of one million contracting cancer is excessive. When estimating this risk, it is assumed that an individual is exposed to the maximum concentration of any given TAC, continuously for 70 years. If the risk of such exposure levels meets or exceeds the threshold of 10 excess cancer cases per one million people, then the CARB and the local air district require the installation of best available control technology (BACT) or maximum available control technology (MACT) to reduce the risk threshold.

The CARB has conducted studies to determine the total cancer inhalation risk to individuals due to outdoor toxic pollutant levels. According to the map prepared by the CARB showing the estimated inhalation cancer risk for TACs in the State of California, the Project site has an existing estimated risk that is greater than 750 cancer cases per one million people (PG&E 2006). This represents the lifetime risk that between 750 and 1,000 people in one million may contract cancer from inhalation of toxic compounds at current ambient concentrations. While TACs are produced by many different sources, the largest contributor to inhalation cancer risk in California is diesel particulates. Diesel particulate matter is primarily emitted into the air by heavy-duty diesel trucks, construction equipment, and passenger cars. According to CARB's Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, the existing average Statewide potential cancer risk from diesel particulate matter is over 500 potential cancer cases per one million people (PG&E 2006).

Greenhouse Gas Emissions and Climate Change

Some gases in the atmosphere affect the Earth's heat balance by absorbing infrared radiation. These gases can prevent the escape of heat in much the same way as glass in a greenhouse. This is often referred to as the "greenhouse effect," and it is responsible for maintaining a habitable climate. On Earth the gases believed to be most responsible for global warming are CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Enhancement of the greenhouse effect can occur when concentrations of these gases exceed the natural concentrations in the atmosphere. Of these gases, CO_2 and methane are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane results primarily from off-gassing associated with agricultural practices and landfills. There is international scientific widespread view that human-caused increases in greenhouse gases (GHGs) has and will continue to contribute to global warming, although there is much uncertainty concerning the magnitude and rate of the warming.

Some of the potential resulting effects in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone concentration days, more large forest fires, and more drought years (CARB 2007c). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done,

the potential for substantial environmental, social, and economic consequences over the long term may be great.

The California Energy Commission (CEC) estimated that in 2004, California produced 492 million gross metric tons of CO_2-equivalent greenhouse gas emissions (CEC 2006). The CEC found that transportation is the source of 41 percent of the State's GHG emissions; followed by electricity generation at 22 percent and industrial sources at 21 percent.

Sensitive Receptors

For the purposes of air quality and public health analyses, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust, air pollutant concentrations, or other disruptions associated with project construction and/or operation. These receptors generally include schools, day care centers, hospitals, residential areas, and parks. Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirmed are more susceptible to respiratory distress and other air quality-related health problems than is the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

Scattered rural residences exist in the vicinity of the proposed pipeline route, including residential subdivisions along the east side of Franklin Boulevard and Bilby Road near the pipeline's proposed northern terminus. There is also one existing elementary school to the west of the proposed pipeline route, and one future school to the west of the proposed pipeline route. The existing Franklin Elementary School is approximately one-half mile west of the proposed pipeline route, west of the intersection of Franklin Boulevard and Hood Franklin Boulevard. The future Miwok Elementary School site is approximately one-half mile east of the proposed route at the corner of Gilliam Drive and Dorcey Drive, in the city of Elk Grove.

4.6.2 Regulatory Setting

Air quality is addressed through the efforts of various Federal, State, and local government agencies. These agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern and agencies primarily responsible for improving the air quality within the proposed Project area and the pertinent regulations are discussed below.

Criteria Air Quality Pollutants

Criteria air pollutants are a group of pollutants for which Federal or State regulatory agencies have adopted ambient air quality standards. Criteria air pollutants include ozone, CO, NO_2, SO_2, particulate matter (both PM_{10} and $PM_{2.5}$), and lead. Most of the criteria pollutants are directly emitted. However, as discussed above, ozone is a secondary pollutant that is formed in the atmosphere by chemical reactions between NO_x and ROG.

To protect human health and the environment, the EPA has set "primary" and "secondary" maximum ambient thresholds for the criteria pollutants. Primary thresholds were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

The NAAQS are defined as the maximum acceptable concentration that may be reached, but not exceeded more than once per year. California has adopted more stringent CAAQS for most of the criteria air pollutants. Table 4.6-3 presents both sets of ambient air quality standards (i.e., Federal and State) and provides a brief discussion of the related health effects and principal sources for each pollutant. California has also established State ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, given the description of the proposed Project, air emissions of these pollutants are not expected under construction or operation of the proposed pipeline and thus, there is no further mention of these pollutants in this Environmental Impact Report.

Table 4.6-3. State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm 0.07 ppm	--- 0.08 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when ROG and NO_X react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	A chemical asphyxiant, CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide*	1 Hour Annual	0.18 ppm 0.03 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility, reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM_{10})	24 Hour Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 –	May irritate eyes and respiratory tract, decreases lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Fine Particulate Matter ($PM_{2.5}$)	24 Hour Annual	– 12 µg/m^3	35 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. Also formed from photochemical reactions of other pollutants, including NO_x, SO_2, and organics.

Notes: *The nitrogen dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes will become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected in late 2007.
ppm = parts per million
µg/m^3 = micrograms per cubic meter.
Source: CARB 2007d

Federal

The EPA is responsible for implementing the myriad of programs established under the Federal Clean Air Act, such as establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIPs), but has delegated the authority to implement many of the Federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

State

The CARB is responsible for establishing and reviewing the State standards, compiling the California SIP, securing approval of that plan from the EPA, and identifying toxic air contaminants. The CARB also regulates mobile sources of emissions in California such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the county or regional level. County or regional air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the Federal Clean Air Act and California Clean Air Act.

Assembly Bill 32 – California Global Warming Solutions Act

California Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, was enacted as legislation in 2006 and requires the CARB to establish a statewide GHG emission cap for 2020 based on 1990 emission levels. AB 32 requires CARB to adopt regulations by January 1, 2008, that will identify and require selected sectors or categories of emitters of GHGs to report and verify their statewide GHG emissions. The CARB is authorized to enforce compliance with the program that will be developed. Under AB 32, the CARB also is required to adopt, by January 1, 2008, a statewide GHG emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990, which must be achieved by 2020. By January 1, 2011, the CARB is required to adopt rules and regulations that shall become operative January 1, 2012, to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 permits the use of market-based compliance mechanisms to achieve those reductions. AB 32 also requires the CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts.

Local

Sacramento Metropolitan Air Quality Management District

The Sacramento Metropolitan Air Quality Management District (SMAQMD) is the primary agency responsible for planning to meet Federal and State ambient air quality standards in the Sacramento Ozone Non-attainment Area. In order to demonstrate the area's ability to eventually meet the Federal ozone standards, the SMAQMD, along with the other air districts in the Non-attainment Area, maintains the region's portion of the SIP for ozone. The Non-attainment Area's part of the SIP is a compilation of regulations that govern how the region and State would comply with the Federal Clean Air Act requirements to attain and maintain the Federal ozone standard. The compilation of rules that comprises the Non-attainment Area's portion of the SIP is contained in a document called the Sacramento Area Regional Ozone Attainment Plan. The most recent update of the Plan was adopted in 1994. Currently, the SMAQMD is working to update the 1994 Plan in recognition of the new Federal eight-hour standard for ozone. The 8-hour Ozone Attainment Demonstration Plan is expected to be finalized by the end of the year 2007 (SMAQMD 2007a).

For PM_{10}, since monitoring data show that the PM_{10} standard is being met in practice, no PM_{10} plan exists in the SMAQMD.

SMAQMD Regulations

The SMAQMD has adopted a number of regulations that would apply to the proposed Project, including Rule 403 – *Fugitive Dust*. Fugitive dust is synonymous with particulate matter. Rule 403 requires any fugitive dust producing source to take every reasonable precaution not to cause or allow fugitive dust from being airborne beyond the construction site. The rule specifies that this can be accomplished by measures that include but are not limited to:

- Use, where possible, of water or chemicals for control of dust;
- Application of asphalt, oil, water, or suitable chemicals; and
- Other means approved by the Air Pollution Control Officer.

Sacramento General Plan

The Sacramento General Plan's Air Quality Element states the county's desire to assist in meeting air quality goals. The element also serves to integrate policies into the General Plan that serve to improve air quality in areas such as land use, circulation, and community design (Sacramento County 1993).

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is the primary agency responsible for planning to meet Federal and State ambient air quality standards in the San Joaquin Valley, including San Joaquin County. In order to demonstrate the ability to eventually meet Federal ozone standards in the SJVAB, the SJVAPCD maintains the region's portion of the SIP for ozone. The SJVAPCD's plan for meeting the standard is called the Extreme Ozone Attainment Demonstration Plan (OADP). The SJVAPCD is also primarily responsible for implementing the OADP and enforcing its regulations. The most recent Extreme OADP was produced for the one-hour ozone standard, and was adopted in October 2004 (SJVAPCD 2003). In response to the new eight-hour ozone standard, the SJVAPCD recently adopted a new eight-hour OADP on April 30, 2007 (SJVAPCD 2007).

For PM_{10}, the other criteria pollutant of concern for the SJVAB, the SJVAPCD has produced a PM_{10} Plan for achieving the National Ambient Air Quality Standards (SJVAPCD 2006). The 2003 PM_{10} Plan was developed to correct deficiencies to previous PM_{10} plans that had been identified by the EPA. The modeling performed for the 2003 PM_{10} Plan showed that the earliest practicable date for achievement of the Federal PM_{10} standard is 2010. The SJVAPCD has no adopted plan for attainment of the $PM_{2.5}$ standards.

SJVAPCD Regulations

The SJVAPCD has several rules that relate to the proposed Project, which are summarized below:

- *Rule 4102 – Nuisance.* Prohibits a person from discharging, from any source whatsoever, such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.
- *Rule 4201 – Particulate Matter Concentration.* Prohibits a person from releasing or discharging into the atmosphere from any single source operation: dust, fumes, or total suspended particulate matter emissions in excess of 0.1 grain per cubic foot of gas at dry standard conditions.
- *Regulation VIII – Fugitive Dust Emissions.* The SJVAPCD also has a number of rules that deal with fugitive dust. The rules include requirements for watering of construction sites, application of dust suppressants, and prevention of track out by heavy-duty equipment.
- *Rule 4002 – National Emission Standards for Hazardous Air Pollutants.* Regulates the identification and handling of asbestos from demolished or renovated buildings.
- *Rule 3135 – Dust Control Plan Fee.* Requires applicants to submit a fee to cover the District's cost of reviewing a Dust Control Plan.
- *Rule 4101 – Visible Emissions.* Prohibits emissions of visible air contaminants to the atmosphere.
- *Rule 4103 – Open Burning.* Regulates the use of open burning and specifies the types of materials that may be burned.
- *Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving, and Maintenance Operations.* Limits ROG from paving operations.

4.6.3 Significance Criteria

An adverse impact on air quality is considered significant and would require mitigation if the Project would:

- Result in construction or operational emissions that exceed quantitative significance thresholds (including quantitative thresholds for ozone precursors) established by air pollution control districts in which the Project would be constructed;
- Result in emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard;

- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable Federal or State ambient air quality standard. Project emissions would be considered "cumulatively considerable" if the Project would:
  - Require a change in the existing land use designation (i.e., general plan amendment, rezone), and projected emissions of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation; or
  - Projected emissions, or emission concentrations, of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation.
- Expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants; or
- Create objectionable odors of such frequency, intensity, or duration that would affect a substantial number of people or be otherwise considered a nuisance.

4.6.4 Impact Analysis and Mitigation

Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Environmental Analysis prepared for the CSLC. APMs that are relevant to this section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this section because it was determined that the APMs would not fully mitigate the impacts for which they are presented.

APM AQ-1. Project Wide Fleet-Average NO_x and Particulate Reduction. PG&E shall provide a plan for approval by SMAQMD and the CSLC, demonstrating that the heavy-duty (>50 horsepower) off-road vehicles to be used in the construction Project, including owned, leased and subcontractor vehicles, would achieve a Project wide fleet-average of 20 percent NO_x reduction and 45 percent particulate reduction compared to the most recent CARB fleet average at time of construction.

APM AQ-2. Off-Road Construction Equipment Inventory. PG&E shall submit to SMAQMD and the CSLC a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that would be used an aggregate of 40 or more hours during any portion of the construction Project. The inventory shall include the horsepower rating,

engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of the Project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the Project representative shall provide SMAQMD with the anticipated construction timeline, including start date and name and phone number of the Project manager and on-site foreman.

APM AQ-3. Visual Surveys for Opacity. PG&E shall ensure that emissions from all off-road diesel powered equipment used on the Project site do not exceed 40 percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately and SMAQMD and the CSLC shall be notified within 48 hours of identification of non-compliant equipment. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted to SMAQMD and the CSLC throughout the duration of the Project, except that the monthly summary shall not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey.

APM AQ-4. Emission Reduction Credits. PG&E shall submit to the SMAQMD Emission Reduction Credit certificates whose value equals the emissions generated in excess of the SMAQMD threshold by the proposed Project.

APM AQ-5. Route Control Valve Fugitive Emissions to the Distribution System. PG&E shall design the proposed Project so that fugitive methane emissions from the transmission line control valves will be routed to the natural gas distribution system instead of to the atmosphere. PG&E shall provide the CSLC documentation that the proposed Project has been engineered so that no fugitive emissions would be released from these transmission line control valves.

Impact Discussion

The proposed Project would result in no direct operational emissions of criteria pollutants. The Project would consist of construction and operation of an 11-mile

underground natural gas transmission pipeline. Operations of the proposed Project would not result in any new sources of criteria air pollutants. The only long-term emissions of criteria pollutants that would occur under the proposed Project would be from worker vehicles associated with periodic maintenance and inspection activities along the proposed pipeline route. However, the proposed Project would result in long-term emissions of methane, which is a GHG.

Activities associated with construction of the Project would generate substantial short term emissions of NO_X. Several construction crews would use various pieces of equipment during different phases of work. NO_x emissions associated with equipment use during the various construction phases were calculated using the URBEMIS 2002, version 8.7, emissions modeling program. For each phase, equipment assumptions provided by PG&E were input into the model. Results of the modeling are included in Appendix C.

Impact AQ-1: Construction NO_x Emissions.

Project construction equipment would generate NO_x emissions in excess of the SMAQMD significance threshold. (Potentially Significant, Class II).

Only a small fraction of overall construction emissions would be generated within the boundaries of the SJVAPCD jurisdiction because less than a quarter mile of the 11-mile pipeline would be constructed within San Joaquin County. Consequently, the SJVAPCD 10-ton annual thresholds for NO_x and ROG in San Joaquin County would not be exceeded. Therefore, the SMAQMD's significance thresholds are the most applicable for determining the significance of the proposed Project.

The SMAQMD has an established NO_x threshold for construction emissions of 85 pounds per day. The greatest amount of NO_x that would be generated in one day has been estimated for a day when several construction phases involving multiple pieces of equipment would occur simultaneously. Maximum daily NO_x emissions have been calculated to be approximately 1,039 pounds per day. Table 4.6-4 shows the calculated maximum day NO_x emissions for each construction phase that would operate simultaneously.

Table 4.6-4. Project Construction Maximum Day NO_x Emissions

Project Phase	Maximum Daily Emissions (Pounds Per Day)
Bending Crew	45.21
Pipe Gang/Firing Line	91.16
Joint Coating Crew	45.21
Lower-in Crew	106.62
Backfill Crew	84.4
Hydro Test Crew	95.12
Drill Crew	372.97
Road Boring Crew	106.62
Support Crew	89.66
Commuting Workers	1.77
Sub Total	**1,038.74**
Total with 20% NOx Reduction	**830.99**
Significance Threshold	85.00
Significant Impact	**YES**

Source: PG&E 2007.

The SMAQMD construction NO_x threshold of 85 pounds per day would be exceeded, resulting in a significant impact. To reduce construction emissions of NO_x, PG&E has committed to implementing SMAQMD standard mitigations to reduce NO_x emissions from off-road diesel powered equipment and control visible emissions from off-road diesel powered equipment. These measures are identified above as Applicant Proposed Measures APM AQ-1 and APM AQ-2. Implementation of these APMs would result in a 20 percent NO_x emission reduction; however, emissions would continue to exceed the significance threshold.

The SMAQMD operates an emission reduction credit (ERC) program. This program allows a company to receive credit for shutting down polluting equipment, converting to cleaner equipment, or otherwise demonstrating emission reduction. The ERCs can later be used to offset future emissions. PG&E proposes to use existing ERCs to reduce the Project's significant construction NO_x emissions impact (see Applicant Proposed Measure APM AQ-4). However, the SMAQMD ERC program is exclusive to stationary emission sources, and is not applicable to construction emissions (SMAQMD 2007b).

The SMAQMD recommends that lead agencies require a fee-based mitigation approach for construction projects when implementation of the SMAQMD's standard construction mitigations does not reduce estimated impacts to less than significant levels. The

mitigation fee is based on every pound of NO_x estimated to be generated in excess of the significance threshold.

The total NO_x emissions for the entire duration of the construction period were calculated for the Project using a construction schedule and equipment list provided by PG&E. The results of this calculation can be found in Appendix C. With the implementation of the APMs, the total construction emissions of NO_x would be 14.17 tons, of which 11.41 tons would be generated over the significance threshold. The SMAQMD provides a calculator spreadsheet to determine the fee for significant construction projects. In addition to the $14,300 per ton of significant NO_x emissions fee, the calculator includes a five percent administrative fee (see Appendix C).

Mitigation for Impact AQ-1:

MM AQ-1. Air Quality Mitigation Fee. PG&E shall submit a mitigation fee to the Sacramento Metropolitan Air Quality Management District (SMAQMD) for significant NO_x construction emissions equal to $171,263, unless a different amount is approved by the SMAQMD. PG&E shall obtain an endorsement letter from the SMAQMD prior to the start of construction. PG&E shall provide the California State Lands Commission documentation that SMAQMD has received the stated mitigation fee payment prior to the start of construction.

Rationale for Mitigation

Applicant Proposed Measures APM AQ-1, APM AQ-2, and APM AQ-4 would not reduce NO_x emissions to less than the significance threshold of 85 pounds per day. The SMAQMD recommends that lead agencies require a fee-based mitigation approach to reduce significant impacts to less than significant when implementation of its standard construction mitigation does not reduce estimated emissions to less than significant. Therefore, implementation of Mitigation Measure AQ-1 would reduce impacts to less than significant (Class II).

Other Criteria Pollutant Emissions

The SMAQMD and SJVAPCD rely on the CAAQS, all of which are concentration-based, to judge significance of large construction projects. Consequently, construction of the Project would violate an air quality standard or contribute substantially to an existing or projected air quality violation if it would produce substantial amounts of pollutants for

which the counties are in nonattainment of Federal or State standards. The only criteria pollutants other than ozone for which the counties are in nonattainment status are the State and Federal PM_{10} and $PM_{2.5}$ standards.

Construction of the Project would generate both PM_{10} and $PM_{2.5}$. PM_{10} would be generated from the disturbance of earth during excavation and backfill phases, as well as by the combustion of fossil fuels during the operation of construction equipment. $PM_{2.5}$ would be generated almost completely by the combustion of fossil fuels by construction equipment.

PM_{10} could be generated in relatively large amounts as excavation would occur along the proposed pipeline route. On windy days, windblown dust could potentially affect residences in the vicinity of active pipeline construction activities. However, the Project would be subject to the requirements of SMAQMD Rule 403 and SJVAPCD Regulation VIII. These rules would require PG&E to ensure that all reasonable precautions be taken to ensure that particulate matter does not become airborne outside of the construction site. The SMAQMD and SJVAPCD are tasked with enforcing the provisions of Rule 403 and Regulation VIII to ensure compliance. In addition, diesel particulates would be reduced by 45 percent through implementation of the standard SMAQMD mitigation as required by Applicant Proposed Measure APM AQ-1 and the opacity of emissions from all off-road diesel powered equipment used on the Project site would be surveyed, so not to exceed 40 percent opacity for more than three minutes in any one hour, pursuant to Applicant Proposed Measure APM AQ-3.

CO would also be generated by Project construction. However, high concentrations of CO are normally associated with high traffic volumes under congested conditions. Also, the CO is primarily a winter problem, due to frequent light winter winds and ground-level temperature inversions that cause reduced CO dispersion. The construction period is proposed to occur during summer and fall months.

Impacts associated with the generation of criteria pollutants other than NO_x would be less than significant (Class III).

Impacts to Sensitive Receptors

Operation of the Project would not expose sensitive receptors to substantial concentrations of criteria pollutants. Project construction for the entire pipeline is expected to last up to four months, and any receptor along the pipeline route would only

be exposed to Project-related emissions for a small fraction of the total construction period.

In addition to the criteria pollutants, TACs would be generated by the use of diesel fueled construction equipment. Diesel TAC can be carcinogenic over long exposure durations. However, nearby receptors would only be exposed to construction emissions for a short portion of the three to four-month construction period. Diesel particulates would be reduced by 45 percent through implementation of the standard SMAQMD mitigation (see Applicant Proposed Measure APM AQ-1) and the opacity of emissions from all off-road diesel powered equipment used on the Project site would be surveyed, so not to exceed 40 percent opacity for more than three minutes in any one hour (see Applicant Proposed Measure APM AQ-3). Consequently, impacts to sensitive receptors would be less than significant (Class III).

Greenhouse Gas Emissions

There are no rules or regulations from the CARB, State Clearinghouse, or other resource agency applicable to the proposed Project that define a “significant” source or amount of GHG emissions, and there are no applicable specific GHG emission limits or caps. And, as of the time of this writing, no air districts within California have established emission thresholds for determining the significance of GHGs from development projects.

While the goal of AB 32 is to reduce in-State GHG emissions to 1990 levels by the year 2020, there is no clear metric that would determine if a single project advances toward or away from this goal. Because global warming is a global issue, a pound of GHGs emitted in California would presumably have the same effect, individually and cumulatively, as a pound of GHGs emitted anywhere else in the world. To determine whether a single project may or may not result in new GHG emissions impacts, one would need to consider any change in world-wide GHG emissions that may occur as a result of the project.

Currently, scientifically credible methodologies for assessing project-specific climate impacts of GHG emissions have not been developed. Nonetheless, both short-term construction and long-term operational GHG emissions would be generated by the proposed Project.

During normal operations, the proposed Project would generate annual fugitive methane emissions of approximately 0.66 metric tons per year. This amount assumes

implementation of Applicant Proposed Measure APM AQ-5, which requires the Project to be engineered so that fugitive methane emissions from the transmission line control valves are vented to the natural gas distribution system instead of to the atmosphere. Because different GHGs have varying effects, global warming potential factors are used to standardize GHG emissions into CO_2 equivalents. CO_2 is assigned a global warming potential factor of one and methane is estimated to have a global warming potential factor of 21 (CEC 2006). Annual GHG emissions for the proposed Project are estimated to be 13.93 metric tons per year of CO_2 equivalents. This estimate of CO_2 equivalents only includes methane, because it is the only GHG that would be emitted by proposed Project operations. These emissions represent a very small fraction (approximately 0.000003 percent) of the 431 million metric tons of CO_2-equivalent GHG emissions produced in California in 2004 (CEC 2006). With regard to construction activities, the proposed Project's CO_2 equivalent GHG emissions have been estimated to be approximately 1,215 metric tons, including CO_2 equipment exhaust emissions and methane emissions from blow-down/tie-in activities (see Appendix C for estimation assumptions).

Under CEQA, the purpose of an EIR is to identify the significant environmental effects of a project (if any), to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided. (Public Resources Code § 21002.1(a).) "Significant effect" is defined under CEQA as "a substantial or potentially substantial, adverse change in the environment." (Public Resources Code § 21068.). The State of California has not provided guidance as to significance thresholds for assessing the impact of GHG emissions on climate change and global warming concerns. However, given the proposed Project's very small contribution of annual GHG emissions and PG&E's commitment to reduce long-term fugitive methane emissions from the pipeline valves (see Applicant Proposed Measure APM AQ-5), impacts are considered to be less than significant (Class III).

Odors

With implementation of Applicant Proposed Measure APM AQ-5, the proposed Project would result in the release of 0.66 metric tons per year of methane dispersed throughout the 11-mile pipeline route. Consequently, there would be little potential for the Project to produce odors that would be noticed at a substantial amount of receptors in the vicinity of the proposed pipeline. Operational odor impacts would be less than significant (Class III). During construction, 1.54 metric tons of natural gas would be released during the blow-down tie-in procedure. This procedure can result in the smell

of gas in the area of the tie-ins at Thornton and Elk Grove Stations and would result in temporary odor impacts at the stations, lasting for approximately eight hours. PG&E would coordinate with the SMAQMD and SJVAPCD to determine when meteorological conditions are such that the methane would rapidly disperse so that impacts would be minimized. Because of the temporary nature of the odor, this would be a less than significant impact (Class III).

Impact and Mitigation Summary

Table 4.6-5 presents a summary of impacts on air quality and recommended mitigation measures.

Table 4.6-5. Summary of Air Quality Impacts and Mitigation Measures

Impact	Mitigation Measure
AQ-1. Construction NO_x Emissions	**MM AQ-1.** Air Quality Mitigation Fee

4.6.5 Impacts of Alternatives

No Project Alternative

The No Project Alternative would not result in the near-term construction of a new natural gas pipeline between the Thornton and Elk Grove Stations. The short-term impacts on air quality described above that would occur under the proposed Project would not occur under the No Project Alternative.

Franklin 1 Alternative

The Franklin 1 Alternative would not result in substantially different emissions than those emissions estimated above for the proposed Project. Therefore, the Franklin 1 Alternative would result in the same potentially significant (Class II) and less than significant (Class III) impacts as would occur under the proposed Project.

Franklin 2 Alternative

The Franklin 2 Alternative would not result in substantially different emissions than those emissions estimated above for the proposed Project. Therefore, the Franklin 2 Alternative would result in the same potentially significant (Class II) and less than significant (Class III) impacts as would occur under the proposed Project.

Project without Bridge Replacement Alternative

The Project without Bridge Replacement Alternative would leave the historic suspension bridge in place, so those removal and demolition activities would not occur. As a result, the Project without Bridge Replacement Alternative would result in slightly less emissions than those estimated above for the proposed Project. However, this would still result in the same potentially significant (Class II) and less than significant (Class III) impacts as would occur under the proposed Project.

4.6.6 Cumulative Projects Impact Analysis

In addition to the proposed Project, other projects may contribute to cumulative air impacts in the vicinity of the proposed Project. The identified cumulative projects potentially contributing to cumulative impacts are discussed in Section 3.4, Cumulative Related Future Projects.

When projects are constructed at the same time, or are timed closely together, they can result in a cumulative impact on air quality in the local area. As discussed in Section 3.4, Cumulative Related Future Projects, several projects including a large housing development project are planned in the vicinity of the Project. The timing of construction for the cumulative projects is unknown, and it is possible that portions of these projects could be constructed at the same time and in the same vicinity as the proposed Project.

Criteria Pollutants and Toxics

Because the vast majority of the proposed Project would be in Sacramento County, the SMAQMD's guidance for assessing cumulative air quality impacts was followed for this analysis (SMAQMD 2004). The SMAQMD considers projects to be cumulatively significant relative to ozone precursors if the project would require a change in the existing land use designation (i.e., general plan amendment or rezone) and emissions of the project would be greater than the emissions anticipated for the site if developed under the existing land use designation. The proposed Project would not require a change to an existing land use designation. Therefore, the proposed Project would not affect the region's ability to attain ambient air quality standards for ozone. Cumulative impacts associated with ozone precursor emissions would be less than significant (Class III).

The SMAQMD considers CO emissions for construction projects, such as the proposed Project, not to be cumulatively significant if the project alone emissions are not

significant. Emissions of PM_{10}, SO_2, and NO_2 are not considered cumulatively significant by SMAQMD if the project alone emissions are not significant and if the project is not cumulatively significant for ozone precursors and CO.

Regarding air toxics emissions, the SMAQMD considers implementation of its project mitigation measures (see APM AQ-1 through APM AQ-3, above) sufficient for a finding of no cumulative impacts, provided no information is available that indicates the possible commingling of toxic pollutants from projects that are nearby could occur. No such information exists in this case. Therefore, cumulative impacts related to criteria pollutant and toxic air emissions would be less than significant (Class III)

Greenhouse Gas Emissions

The SMAQMD currently does not provide any guidance on assessing cumulative impacts relative to GHG emissions. The proposed Project would generate annual fugitive methane emissions of approximately 0.66 metric tons per year, which equates to approximately 13.93 metric tons per year of CO_2 equivalents. These emissions represent less than 0.000003 percent of the total GHG emissions produced in California in 2004 (CEC 2006). During construction and blow-down/tie-in activities, the proposed Project's CO_2 equivalent GHG emissions have been estimated to be approximately 1,215 metric tons (see Appendix C for estimation assumptions). The GHG emissions from the Project would be insignificant alone, but could exacerbate the global warming effects in combination with GHGs from other proposed projects. However, the proposed Project's long-term GHG contribution would not be expected to result in an obstacle to the State complying with AB 32. Cumulative impacts associated with GHG emissions would be less than significant (Class III).

Odors

The SMAQMD currently does not provide any guidance on assessing cumulative impacts related to odors. The proposed Project would result in the release of 0.65 metric tons of methane per year dispersed throughout the 11-mile pipeline route, which would be less than significant for the project alone (Class III). The other natural gas pipeline projects identified in Section 3.4, Cumulative Related Future Projects, would not operate within the same immediate vicinity as the proposed pipeline corridor. Therefore, there would be little potential for the Project to result in methane odors that would be cumulatively considerable. Cumulative odor impacts would be less than significant (Class III).